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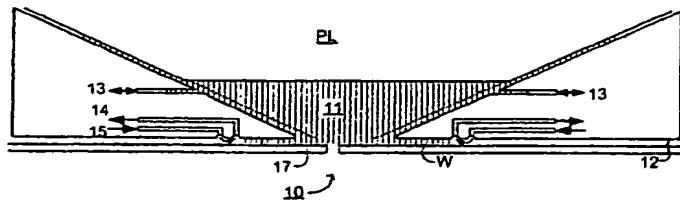
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(54) Lithographic apparatus and device manufacturing method

(57) A lithographic projection apparatus is disclosed in which the space between the final element of the projection system and the substrate is filled with a liquid.

An edge seal member 17, 117 at least partly surrounds the substrate W or other object on the substrate table WT to prevent catastrophic liquid loss when edge portions of the substrate or are imaged or illuminated.

Fig. 3





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EUROPEAN SEARCH REPORT

Application Number
EP 03 25 7068

DOCUMENTS CONSIDERED TO BE RELEVANT									
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.)						
A,D	WO 99/49504 A (FUKAMI YOSHIO ;MAGOME NOBUTAKA (JP); NIPPON KOGAKU KK (JP)) 30 September 1999 (1999-09-30) * abstract; figures 4,5 *	1-11	G03F7/20						
A	EP 0 605 103 A (CANON KK) 6 July 1994 (1994-07-06) * column 7, line 9 - column 8, line 10; figure 2 *	1-33, 39-45							
X	* column 10, line 12 - line 29; figure 6 *	34, 35, 38							
A	* abstract *	36, 38							
A	* column 5, line 41 - column 6, line 19; figures 1,6 *								
A	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 08, 29 September 1995 (1995-09-29) & JP 07 132262 A (TOKYO ELECTRON LTD), 23 May 1995 (1995-05-23) * abstract *	1-11							
A	US 4 480 910 A (TAKANASHI AKIHIRO ET AL) 6 November 1984 (1984-11-06) * column 2, line 61 - column 3, line 23; figures 2,3 *	1-11	G03F						
A	US 5 900 354 A (BATCHELDER JOHN SAMUEL) 4 May 1999 (1999-05-04) * column 7, line 19 - line 65; figure 4 *	1-33, 39-45							
A	US 4 390 273 A (LOEBACH ERNST W ET AL) 28 June 1983 (1983-06-28) * column 6, line 40 - line 65; figure 5 *	1-33, 39-45							
<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 33%;">Examiner</td> </tr> <tr> <td>Munich</td> <td>17 August 2004</td> <td>van Toledo, W</td> </tr> </table> <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>				Place of search	Date of completion of the search	Examiner	Munich	17 August 2004	van Toledo, W
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Munich	17 August 2004	van Toledo, W							



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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

European Patent
OfficeLACK OF UNITY OF INVENTION
SHEET BApplication Number
EP 03 25 7068

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-33, 39-45

Immersion lithographic projection apparatus of which the substrate table comprises means to maintain a contact seal around a side edge of an object on the substrate table.

2. claims: 34-38

Immersion lithographic projection apparatus of which the substrate table comprises a support surface for an intermediary plate.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

17-08-2004

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 9949504	A	30-09-1999	AU WO	2747999 A 9949504 A1	18-10-1999 30-09-1999
EP 0605103	A	06-07-1994	JP JP DE DE EP US	2753930 B2 6168866 A 69321571 D1 69321571 T2 0605103 A1 5610683 A	20-05-1998 14-06-1994 19-11-1998 08-04-1999 06-07-1994 11-03-1997
JP 07132262	A	23-05-1995	JP	2520833 B2	31-07-1996
US 4480910	A	06-11-1984	JP JP JP CA DE EP	1501475 C 57153433 A 63049893 B 1159160 A1 3272511 D1 0060729 A2	28-06-1989 22-09-1982 06-10-1988 20-12-1983 18-09-1986 22-09-1982
US 5900354	A	04-05-1999	WO	9901797 A1	14-01-1999
US 4390273	A	28-06-1983	JP JP JP	1483033 C 57188039 A 63032379 B	27-02-1989 18-11-1982 29-06-1988

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82